

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A radiation detector in which primary electrons are released into a gas by ionizing radiation from a radiation source (10) and are caused to drift to read-out electrodes (1) by means of an electric field (2) generated by applying a negative tension to a drifting electrode (11) located near the radiation source (10), said radiation detector comprising:

a matrix of electric field condensing areas, each of said condensing areas producing a local electric field gradient sufficient to generate in said gas an electron avalanche from one of said primary electrons so that said gas electron multiplier operates as an amplifier for said primary electrons;~~and;~~

a position-sensitive signal detector comprising read-out electrodes (1) to which is applied a tension which is positive relatively to the drifting electrode (11); and

~~characterized in that~~ wherein said matrix of electric field condensing areas and said signal detector are united in a same dual-purpose physical structure (3).

2. (Currently Amended) The radiation detector of claim 1, ~~characterized in that~~ wherein said dual-purpose physical structure (3) comprises:

a first set of longitudinal electrodes (1) disposed parallel to each other to form a first plane (4) closest to the radiation source (10), said first plane being substantially perpendicular to said electric field (2) ~~and;~~

at least one additional set of longitudinal electrodes (1) disposed parallel to each other to form at least one additional plane (4'), said additional plane or planes being superposed and parallel to said first plane (4);

wherein the direction of the longitudinal electrodes (1) in each of said planes forms an angle with the direction of the longitudinal electrodes (1) in each of the other plane or planes, each crossing of said longitudinal electrodes in their respective planes producing a local electric field gradient; and

wherein the longitudinal electrodes (1) in the respective planes are applied progressively positive tensions relatively to the drifting electrode (11) when going from the plane (4) closest to the drifting electrode to the plane farthest from the drifting electrode, said plane farthest from the drifting electrode being applied a positive tension.

3. (Currently Amended) The radiation detector of claim 2, ~~characterized in that~~ wherein said dual-purpose structure (3) comprises two sets of longitudinal electrodes (1) forming two superposed planes (4) and (4'), ~~and in that~~, when viewed from above, the direction of the longitudinal electrodes (1) in the first plane (4) is perpendicular to the direction of the longitudinal electrodes (1) in the second plane (4').

4. (Currently Amended) The radiation detector of claim 2, ~~characterized in that~~ wherein said dual-purpose structure (3) comprises three sets of longitudinal electrodes (1) forming three superposed planes, (4), (4') and (4''), ~~in that~~ the direction of the longitudinal electrodes (1) in each plane forms an angle of 60 degrees with the direction of the longitudinal electrodes (1) in each of the other planes, ~~and in that~~, when viewed from above, the longitudinal electrodes (1) in a given plane cross the longitudinal electrodes (1) in the two other planes at the same points (5) where the longitudinal electrodes (1) in these two other planes cross.

5. (Currently Amended) The radiation detector of ~~any of claims 2 to 4,~~
~~characterized in that~~ wherein the longitudinal electrodes ~~(1)~~ disposed parallel to each other
forming said planes are conductive strips ~~(6)~~.

6. (Currently Amended) The radiation detector of claim 5, ~~characterized in that~~
wherein said planes are spaced by spacers ~~(7)~~ located at the crossing points ~~(5)~~ of said
conductive strips.

7. (Currently Amended) The radiation detector of claim 6, ~~characterized in that~~
wherein said spacers ~~(7)~~ are made of polyimide.

8. (Currently Amended) The radiation detector of claim 6, ~~characterized in that~~
wherein said spacers ~~(7)~~ are made of glue.

9. (Currently Amended) The radiation detector of ~~any of claims 2 to 4,~~
~~characterized in that~~ wherein the parallel longitudinal electrodes ~~(1)~~ disposed parallel to
each other forming said planes are conductive wires ~~(8)~~.

10. (Currently Amended) The radiation detector of claim 9, ~~characterized in that~~
wherein said conductive wires ~~(8)~~ are woven with non-conductive wires ~~(9)~~ to form a mesh,
said conductive wires being oriented according to a first axis and said non-conductive wires
being oriented according to a second axis, said second axis being perpendicular to the first
axis.

11. (Currently Amended) The radiation detector of claim 10, ~~characterized in that~~
wherein said conductive wires (8) are individually alternated with non-conductive wires (9)
in said first axis.

12. (Currently Amended) The radiation detector of ~~any of claims 2 to 11,~~
~~characterized in that~~ wherein the longitudinal electrodes (1) in said dual-purpose structure (3)
are made of Tungsten.

13. (Currently Amended) The radiation detector of ~~any of claims 1 to 12,~~
~~characterized in that~~ wherein said dual-purpose physical structure (3) is mechanically
flexible.